

RURAL DEVELOPMENT SERIES

No. 1

MILK GOATS

BY

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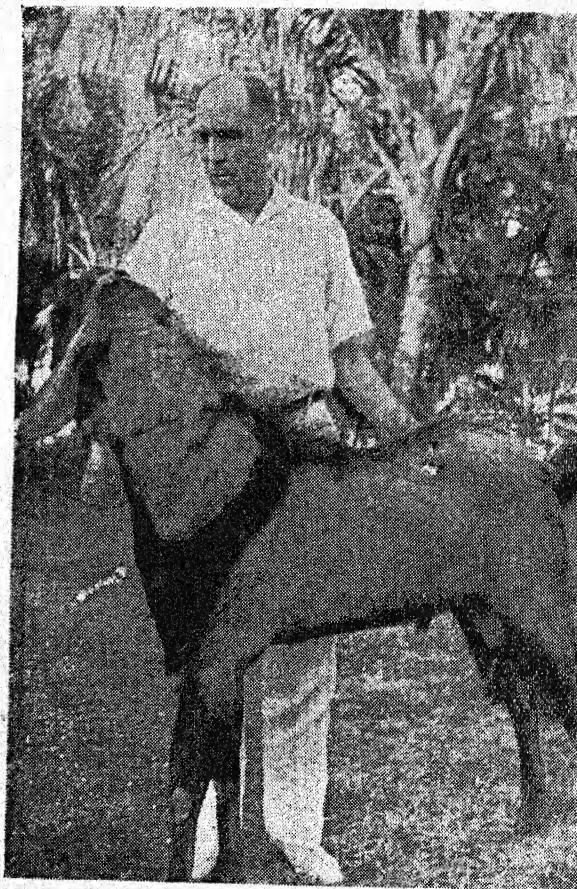
Kalpadi, South India

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JUMNA-PARI MALE WITH THE AUTHOR

NOTE BY THE AUTHOR

THE material dealt with in this little booklet has the backing of fifteen years of practical experience in working with milking goats at our Agricultural Institute, Katpadi. It is sample of the kind of 'Goat teaching' we are attempting to impart to the students who attend our classes. It also represents the kind of 'Goat preaching' we pass on freely to all who visit our demonstration farm. We might call it our 'Gospel of the Goat' with which we attempt to convert the people of India to a better balanced diet for their families. Many of the 94 questions have been taken from our correspondence files of the past years and represents the kind of detailed information required by those who have been trying to follow our advice in introducing the dairy goat into their family economy.

His Excellency, Lord Linlithgow, the Viceroy of India, is a keen cattle breeder and very much interested in the development of India's live stock. One of the first steps he took upon arrival in India as Viceroy, even before reaching New Delhi, was to purchase and place at stud, several breeding bulls. The need for this had been indelibly impressed upon his mind when he made a detailed study of India's economic conditions as Chairman of the Royal Commission on Agriculture in 1928. A copy of the manuscript of this booklet was submitted to him and his Secretary acknowledging the same says:—

'His Excellency desires me to thank you for your kindness in sending him the copy which was enclosed in your letter of 12th June of your pamphlet on Milk Goats which he has been much interested to read.'

We are happy to pass on this simple little booklet in as cheap a form as possible that it may go into the high-ways and by-ways to build for a happier, more prosperous, better-fed people in the villages of India. If it serves this purpose, even in a small way, we will feel amply repaid for the effort.

J. J. DE VALOIS

KATPADI

June 30, 1942

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1. GOATS—GENERAL

How many goats are there in India?

India has more goats than any other country in the world. *Agricultural Statistics of India*, Vol. I, 1926-27, estimates that there are about 40,000,000 goats in British India distributed in the chief provinces as follows:—

Madras	...	...	8,048,928
United Provinces	...	...	7,473,441
Bengal	...	...	6,007,026
Bihar and Orissa	...	...	5,764,832
Punjab	...	...	4,471,972
C. P. and Bihar	...	...	1,381,503

This shows the relative importance of goats in South India. And still, how little is done for the development of this important animal industry of the Madras Presidency? Unfortunately, most of these more than eight million goats in our province are the ordinary scrub village goat kept for manuring the fields and to provide the owner with a cash income from the sale of a few animals for meat to the butcher each year. They are the bane of the farmer's life, denuding all the forests and making it virtually impossible to get any young plants, trees or shrubs started. I am not interested in this class of goats, and the information given in this booklet concerns ONLY the family milk goat and not these public pests that have given all goats a bad name.

**What do you think of goats? Are they not a nuisance?
May they not justly be classed as 'vermin'?**

There is time and a place for all things and so I consider this matter of goats. I can think of no bigger nuisance than an uncontrolled goat, unless perhaps it be an uncontrolled child. Uncared for, undisciplined, roaming about at large, the waif of the street—a nuisance to society, be it a goat or a human being.

But, nothing with proper care and attention can be a greater blessing in the home than a child. So it is with the family goat. It too must be fed and cared for so that it in turn will feed you and your family. I hope the day may come when India will learn to give a deserving place to the family milk goat.

Is the goat a modern invention like the aeroplane or radio?

Not at all. Some of the earliest literature we have speaks of goat's milk, wool and meat. Goats were one of the first animals domesticated by man. Goats and their products are mentioned frequently in the Bible as also in the earliest literature. Excavations have revealed the remains of goats among ancient ruins. The Jews, like the Bedouins of today, used their wool and hair for cloth and tent making. The Jews sacrificed goats as an offering to Jehovah. Their milk and meat were important food items. The ancient Egyptians owned large flocks of goats. Goats are frequently mentioned in Greek and Roman literature. In fact, goats have been kept wherever man has gone in his wanderings over the earth for generations.

What is meant by the term 'The poor man's cow'?

It has been proved conclusively that the goat is the most economical milk-producing animal in the world.

It eats a wide variety of feeds. Six or seven goats can be fed as cheaply as one cow, giving a much larger milk yield proportionately. The quantity of milk a goat gives daily will supply the minimum amount of milk the average family can afford to use. Dr. Aykroyd, Director of the Nutrition Research Laboratory, Coonoor, recommends that 8 ounces of milk a day be the minimum to use in an Indian diet. A good goat giving three pounds a day would supply this for the average family. Therefore, the lowly goat truly is 'the poor man's cow'. Two good goats, well kept, should keep a family in milk all the year round.

In what classes of homes is the goat most popular in America ?

Primarily in two grades of society; either among the very rich as a hobby and a pastime, or among the very poor as a dairy animal. The best goats in America today are owned by millionaires, authors, poets, professors and elite society people. It is their hobby. We found goats milk selling from 75 cents to a dollar a quart and much sought after by the class of society who could afford to pay from six to ten times the price of cow's milk.

Of recent years the keeping of a few backyard goats by poor families on relief has become very common. They have learnt to appreciate an economical way of solving their milk supply problem. It is estimated that there are over 1,000,000 dairy goats in America today and their numbers are increasing every year. Many Colleges of Agriculture have opened goat sections to cope with the increased demand for help along this line.

What is the future of the goat in India ?

I believe the time is coming soon when promiscuous keeping of goats will be forbidden by Government and Municipal authorities. I say 'speed the day!' But I feel equally certain that the family milk goat, kept tied up at home, properly fed and cared for, will be increasingly popular as the years go by. India cannot afford to overlook this most economical and most satisfactory family milk producer as the value of a better diet becomes better known and more universally adopted.

Who are the people in India who seem most interested in goats?

In general I should say that the Mohammadan people take the greatest interest in goats in South India. Many leading persons in this community have learned to appreciate the value of a family goat milk. Goats found roaming about the bazaars in towns and villages, are invariably owned by Mohammadans. This may be due to the fact that the Muslims in India are descendants from goat-keeping families for centuries.

Where is the keeping of milk goats highly developed in South India ?

In Malabar, chiefly among the Moplahs around Calicut, Tellicherry and Cochin, keeping milch goats is a very common Cottage Industry for thousands of families. Originally importations are said to have been made by Arab traders. These goats are very mixed in character and not at all standardized. No scientific breeding is carried on so that progress is not being made in improving the breed though some very fine animals are found. The large, individual compounds and heavy rainfall

providing abundant vegetation are factors favouring the industry. The many coffee shops using goat's milk exclusively is evidence of the fact that here at least goat's milk is appreciated.

Is the dairy goat winning its way in other countries ?

Very much so. The departments of Agriculture in England and America are taking serious recognition of goats today, while they were the laughing stock in Animal Husbandry Circles twenty-five years ago. Canada, South Africa, New South Wales and other countries have literature available on goats at present, and interest is growing yearly.

The Imperial Council of Agricultural Research, New Delhi, subsidizes a goat-breeding scheme for the Mission Poultry Farm, Etah, U.P.

Very little has been done with goats in South India in spite of the fact that the Madras Presidency has more goats than any other Province in India. More could be done if the public were insistent in their demands that this important branch of animal Industry be given its proper attention in South India. A scheme for the improvement of goats in South India was approved by the Imperial Council of Agricultural Research, several years ago, but it never came into operation because the Madras Government Authorities did not press their claims to secure the necessary finances from the Council to begin the work.

Is the skin of the goat of any particular commercial value ?

Very much so. The large number of tanneries in the country is evidence of this fact. India derives a most

valuable income from the export of partially tanned goat skins. In 1926 the United States of America imported 68,000,000 wet, salted goat skins, a goodly proportion of which came from India. Goat skins are largely used in the manufacture of shoes, classified as 'kid'.

II. BREEDS AND BREEDING

What are the most common breeds of goats in the world ?

The most common breeds of dairy goats listed in order of numerical importance are the Toggenburg, Saanan, Nubian, Alpine and Maltese.

Where did the Toggenburg goat originate ?

This breed takes its name from the Toggenburg Valley in Switzerland. Their colour varies from fawn to brown, usually having two white stripes down the face. They frequently resemble the appearance of a deer in their snappy carriage and alertness. They usually are white around the ears and tail as well as having white legs. Their hair is quite long. Horns are not common but do appear. The buck will weigh from 150 to 175 pounds and the doe from 100 to 135 pounds. This is the most common dairy goat in many countries of the world.

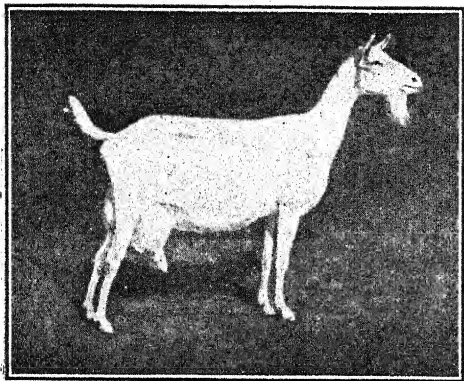
What are the characteristics of the Saanan ?

Saanan goats are white or cream coloured, short haired and slightly larger than the Toggenburg. They too originated in Switzerland.

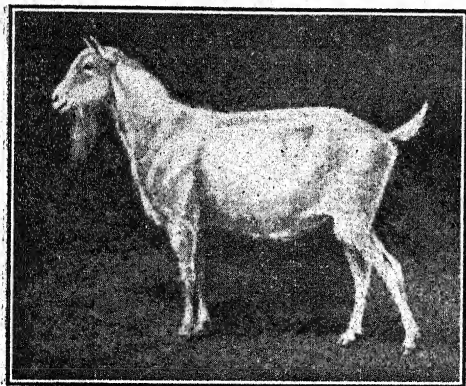
What about the Nubian ?

This breed was produced by crossing imported animals from Asia and Nubia in Africa with the native goat

found in other countries. The colour may be white, brown or black. They have the Roman nose and long,



SAANAN DOE



• SAANAN BUCK

pendulous ears. Many of the common bazaar goats in India resemble this breed.

Does India have any definite milking breed of goats?

Yes, there are three or four varieties that are more or less distinctive, namely the Surti, the Jumna Pari, the Bari-Bari, the Nubian and the Cutch Goat. All of these varieties are still in the process of being standardized, however.

What is the appearance of the Jumna Pari goat?

This breed is native to the United Provinces, where in certain areas they can be found in large numbers. The Jumna Pari is the largest of the Indian breeds, males weighing about 150 lbs. and the females 100 to 110 lbs. They are well adapted to extensive grazing areas, and are frequently preferred because of their large size as a meat animal.

The Roman nose and long, drooping, pendulous ears, often 10 to 12 inches long, are characteristic features. They are not very prolific, frequently dropping only one kid. Dark brown with black markings is the preferred colour but light browns and black and white individuals are found as well.

Where did the Surti goat originate?

The Surti breed originated in or near the city of Surat in Gujerat. They are small white animals, somewhat resembling the Saanan, though smaller. They are a short haired breed, usually hornless. The males usually have a heavy beard. Wattles too are common. They make a good goat for families living in limited quarters because

of their relatively small size, and good milking qualities. They are very prolific, often giving twins, triplets and even quintuplets.

What other milk goat breeds are there in India?

The Bari-Bari is a small black goat found in North India said to have been imported from Africa. The Cutch or West Coast goat is prevalent in Malabar. The Oosmanabad breed is found in Hyderabad State but is more of a meat goat variety, being of great size. We are trying to standardize a variety of the Nubian at Katpadi in order to make it a definite breed with certain specific characteristics suitable to Indian conditions.

How do these breeds compare in milk production?

An English goat is reported to hold the world's record having given 21 lbs. 6 oz. of milk in 24 hours. A record of 5,050 lbs. of milk in 365 days by one doe is also recorded. Individuals giving 10 to 12 pounds daily are not uncommon in the West, although a six-quart (12 lbs.) doe is considered an outstanding animal and much sought after. An animal yielding 6 to 8 lbs. of milk a day and from 1,000 to 1,500 lbs. in a lactation period of 9 months is still considered a valuable doe in England and America.

In Malabar some outstanding does are reported to give 4 one-quart bottles a day (one quart is 2 lbs.—a Madras measure of 8 Ollocks, is 4 lbs.).

A doe in South India that gives 5 to 6 ollocks a day must be considered a valuable animal and well above the average in milking capacity.

What is the average production per cow per year in various countries ?

The United States Department of Agriculture lists :—

Friesland (Netherlands)	...	lbs.	9,632
Denmark	...	"	7,300
Switzerland	...	"	6,600
Germany	...	"	5,614
England	...	"	4,965
France	...	"	4,278
United States	...	"	4,499
Canada	...	"	4,010
Italy	...	"	2,976
Russia (U. S. S. R.)	...	"	2,318
India (Average as per Provincial Marketing Surveys)	...	"	613

In the light of the above, how do various Provinces in India compare in lbs. of milk produced per cow or buffalo per year ?

Provincial Marketing Surveys show :—

	Cows	Buffaloes
Delhi	... 1,521	1,931
Punjab	... 1,444	2,238
Central India	... 1,051	1,029
Western India States (Kathiawar)	... 939	2,473
Sind	... 982	1,537
United Provinces	... 822	1,029
Bombay	... 510	857
Madras	... 445	796

I make note of the above to show that there are good milk goats in India, including some at our Katpadi Farm,

that give more milk per year than the average cow or buffalo in the Province.

How soon can a young doe be mated ?

Precarious doe kids will often come into heat at 6 months of age while still quite immature. Cases are recorded in which does have kidded when less than 9 months of age. However, breeding at this age is very undesirable and stunts the growth of the young animal. If young does have been well fed and cared for and have attained good size, mating may take place at 12 months, though many of the best breeders prefer to wait till 18 months of age.

What is the gestation period in goats ?

Records show this to be from 145 to 155 days with the average about 150 days or roughly five months.

What is meant by the term 'Like begets like' ?

This means that heredity is a very important factor in a breeding programme. It therefore is of vital importance that the ancestry of breeding animals be known for as many generations in the past as possible. For this purpose livestock breeders maintain pedigrees of their animals, which is a printed, authentic record of an animal's parentage. Such records are kept at great cost and with meticulous care by Government authorised bodies in the West for the purpose of continually improving classes of livestock. This is one of the chief factors that has made possible the great improvement in all classes of domesticated animals.

Is the statement 'The male is half the herd' correct?

It certainly is. The father transmits to the offspring as many desirable or undesirable characteristics as does the mother. This fact is not generally recognized by many village people. They often recognize the importance of having a good cow or a good doe in selecting a calf or a kid, quite forgetting the equally important part transmitted by the male. If a man has 50 cows or does, one male is sufficient to cover them all. Therefore, if



SURTI DOE AND KIDS

each mother has one young, the father will have 50 offspring, thereby being truly 'half the herd'. Consequently, the greatest care and attention should be given in selecting the best possible male. Following this principle, fabulous sums are paid in the West for stud bulls, stallions, boars, bucks, rams and cocks. One may easily pay too much money for a female, but one is not likely to do so for a well-bred male. Be sure to get the best from a reliable breeder if you wish to improve your herd. Do not be fooled by getting something *cheap*!

Do goats breed every month of the year ?

Yes and no. In Western countries the Spring of the year—March, April, May—is the natural breeding season and the time for young animals to be born. In India we find that the breeding season follows the early rains of May, June and July so that most goat kids are born in November, December and January. However, the time of breeding can be partially controlled which is desirable so that a continuous supply of milk may be available throughout the year.

How often can I expect twins or triplets from my goats ?

This varies greatly according to breeds as well as to families and individuals within a breed. We find for example that our Jumna Pari does drop single kids much more frequently than do the Surtis or Nubians. But, certain does are exceptions to this rule. Roughly speaking, you can expect twins from Jumna Pari does about one-third of the time while Surtis and Katpadi Nubians will have multiple births from half to three-fifths of the kiddings. These two breeds are definitely more prolific than are the Jumna Pari.

At what age should male and female kids be separated ?

Young unsexed males of three months and above should never be permitted to remain with the female kids or older does. To do so, is to court trouble, permit promiscuous breeding and cause endless worry and bother, thus decreasing the efficiency of your goat project.

At what age can I use my buck for service?

Well-fed male kids mature sexually at three to four months. But no service should be permitted before six to eight months of age when at intervals of two or three weeks, services may be permitted. Only after being fully matured, after 18 months, should full use be made of the buck.

How many services can a buck be given satisfactorily?

A strong, virile, well-matured and well-fed buck can safely be allowed up to 100 females a year if properly regulated. He should never be allowed to cover the doe more than once which is quite sufficient. Intervals of 2-3 days between services is also desirable.

What is the period of usefulness for a goat?

Does reach their maximum efficiency at from five to seven years of age. Ordinarily, they are of little use after their ninth or tenth year although some goats have continued to be very serviceable even up to 12 and in rare cases 14 years of age.

What is the stud Goat Scheme in England?

In 1924 the Ministry of Agriculture working with the British Goat Society began a scheme to finance the standing of stud bucks for public service in order to improve goats in England, especially among small land owners. The scheme provides:

- (a) Bucks must be approved and registered in the British Goat Society Herd Book.
- (b) Stud buck owners are paid 4 shillings by the Government for every service recorded.

(c) A paid staff is maintained to supervise and inspect the work. From 73 to 102 bucks have been standing at stud from 1924 to 1938 and from 822 to 1826 services recorded.

What is the Angora goat ?

There are two types of wool-producing goats. One is the Angora goat which produces mohair often 10-12 inches in length, used extensively in the manufacture of dress goods, rugs, imitation furs and wigs. The other is the Cashmere goat of North India, from which the famous Cashmere shawls are made.

The use of mohair can be traced back to the time of Moses (1571-1451 B.C.) for the Bible records the use of goats hair. Note (Exod. xxvi. 7; xxxvi. 41; xxv. 4; xxxv. 6-26; I Sam. xix. 13, 16).

The Angora goat derives its name from the Province of Angora in Asia Minor, where it is said they were common 2400 years ago. These goats are still very numerous in Turkey from where they have spread to S. Africa and to the United States of America, where in the State of Texas particularly, large flocks can be found. They are not valued primarily as milk goats but in the production of mohair which is of great industrial importance.

III. FEEDS AND FEEDING

Is it true that goats will eat anything and everything ?

This is most certainly not true. The goat is one of the cleanest of domestic animals in the selection of its food. Trample leaves or grain in the dust or foul it in any way and see if a goat will condescend to touch it, as

would a cow, pig or chicken. Does particularly are very clean, fastidious animals and if given half a chance will produce the most wholesome milk you can wish for. A boy matching jumbled words into incomplete sentences, produced this classic libel against our friends—'The goat is an ecclesiastical animal eating everything in sight including tin cans.' The goat does eat a wider variety of feeds than any other animal which is a factor in its favour, but it is a clean feeder and not a scavenger like a pig or a chicken.

What is the best feed for goats ?

We are considering the needs of milking goats primarily. I frankly have little interest in the ordinary goat kept in the villages by the thousands for manure and mutton. These have ruined the name of all goats because of their destructive nature. I visualize here the family milking goat. They require fodder for roughage, concentrated feeds, minerals and water.

What fodder can be given ?

Goats will eat a wide variety of feeds. They will browse on various classes of grass. Many classes of leaves are to their special liking as, for example, jack leaves, banyan, babul (*Acacia Arabica*), rain trees, margosa, mango, tamarind, korukapalli and numbers of other trees and shrubs. They are especially fond of leaves growing on thorny shrubs. The leaves of trees and shrubs is the most common pasturage for goats in India.

What other fodder crops will goats thrive on ?

Agithi leaves are excellent fodder for goats and can generally be bought in most South India towns. Grass

clippings are good, and most weeds will be eaten with relish. Guinea grass, Napier and Lucerne are cultivated fodder crops that are very good. Gram husk is also a very acceptable fodder for the summer months when grazing and green feed is limited. A good deal of waste from the kitchen can also be utilized, such as plantain skins, vegetable tops, potato peelings, etc. The utilization of such waste materials is what makes the keeping of one or two family goats such an economical project.

How much roughage should be fed daily ?

Feed all that the goat will clean up nicely. It does not pay to skimp feeding a good goat. Roughly speaking, an adult doe will eat 3 lbs. of dried fodder a day. A variety of feed is desirable for a goat the same as it is for man. Therefore, it is best to feed some leaves, some kitchen waste and some fodder like gram husk or agithi every day.

If I give plenty of leaves and roughage, is that sufficient feed for my goat ?

If your doe is not milking, the feeding of grain and concentrated feed may not be necessary when abundant fodder is available. But, you cannot expect a good supply of milk unless some concentrate is given. The amount will depend upon the milk yield and the size of the animal. Roughly speaking, milking does should be fed one pound of concentrated feed a day as a maintenance ration and an additional four ounces of concentrates for each pound of milk produced in 24 hours. A goat that is producing 4 pounds of milk a day therefore should be given two pounds of concentrated feed.

What are some satisfactory feeding mixtures ?

The following feeding mixtures have been given with success in various parts of India:—

(a) Wheat bran 4 lbs.; crushed gram 1 lb.; crushed barley 1 lb.; groundnut cake 2 lbs.

(b) Boiled maize 2 lbs.; wheat bran 2 lbs.; crushed oats 4 lbs.; gingelly cake 2 lbs.

(c) Katpadi basic ration.

One half o'clock of horsegram soaked in water for 24 hours and slightly sprouted given in the morning before milking. One half pound groundnut cake or gingelly oil cake soaked in water for twelve hours and given as a Kanji drink at noon. Another half o'clock gram, the same as the morning feed, given after milking at night. This feed is correspondingly increased according to the milk given by each doe. The basic ration costs about half anna per goat per day.

Should salt be given to goats ?

Yes, it is well to add one per cent of salt to the concentrated feed mixture and in addition to have a salt block constantly available for goats to lick as they please. Or a salt lick may be made of coarse salt 80 parts plus Epsom salts 5 parts plus bone meal 15 parts. This should be placed where the goats can take it at will.

Do goats require a mineral mixture as well ?

We do not believe in complicated mineral mixtures or so called tonics. From 1 to 2 per cent of steamed bone meal and a small quantity of ground limestone added to the grain feed will supply all the minerals goats require.

How often should a goat be fed daily ?

The grain mixture should be fed twice a day, morning and evening. Fodder should be given at least three times a day and only in such quantities as will be cleaned up within 45 minutes.

Is regularity of feeding an important consideration ?

Very much so. I recall speaking in an American church to a congregation of dairy farmers. The Pastor requested the three speakers to close the addresses by a certain time 'because if you do not', said he, 'the people will all leave without fail. They must and will go home to milk their cows.' Regularity of feeding and attention is a very important factor in a successful project. Give your animals the best of care but neglect them or be careless one day a month and all efforts are in vain. Most Indian farmers do not yet understand the vital importance of this principle.

Do goats require water ?

Yes, giving plenty of clean, fresh water is the cheapest and most necessary feeding detail.

What about the feeding of goat kids ?

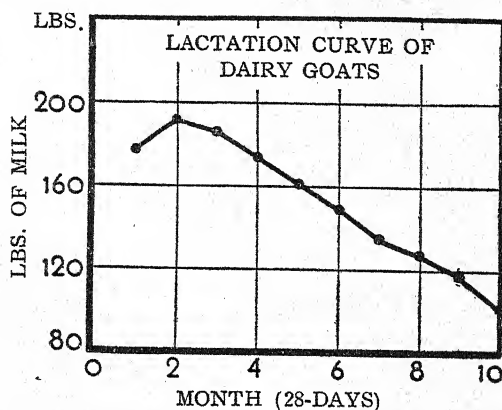
These little fellows require the first milk from their mother after being born. This is called 'colostrum milk' and serves as a tonic for the young kid. About 22 oz. of milk is required by a good-sized kid the first week ; 32-34 ounces the second and third weeks. Up to this time, they should be permitted to nurse from 3 to 5 times a day. After the third week kids should be given small quantities of concentrated feeds like wheat bran to teach them to eat. At $3\frac{1}{2}$ months of age, the night feeding of milk may be discontinued and at 4 months the

kids may be weaned entirely, provided that plenty of fodder and concentrated feed is given instead. However, be warned of the danger of starving young animals. It is the worst possible practice. Stunted kids will never make good goats. Well-bred young goats should be given all the properly balanced food they can eat. It never pays to save on feed! In India the average cow does not mature till she is about five years old because she is starved. She should have matured and been in production two years earlier had she been properly fed. Good breeding is of little advantage unless it is accompanied by good feeding. Both together are essential.

IV. GOAT'S MILK

How long can goats be milked?

A doe after kidding will usually increase in milk production the first month and then gradually decrease



The lactation curve of about 75 dairy goats.* Milk secretion increases gradually for some time and then declines slowly.

* Data from Cornell (U.S.A.) Bulletin.

—(note Lactation chart). Good milking does if well fed and not mated will often continue to milk for two years, but the maximum milk return is obtained from a doe when she is made to kid once every 8 or 9 months, i.e., by serving her about four months after each kidding.

How does goat's milk compare with cow's milk?

Goat's milk is almost pure white in colour and the fat globules small in size. As a consequence, the cream rises slowly and never as completely as in cow's milk. The fat, however, can be removed and varies from 3 to 5 per cent. Other constituents of goat's milk are quite similar to cow's milk. Note the following chart showing the composition of goat's milk compared with human milk and that produced by other farm animals.

Species	Fat %	Protein %	Lactose %	Ash %	Total % solids	Authority
Goat	4.09	3.71	4.20	0.78	12.86	Frahm
Cow	4.00	3.50	4.90	0.70	13.10	Computed
Mare	1.59	2.69	6.14	0.51	10.96	Linton
Sow	6.77	6.22	4.02	0.97	17.98	Hughes and Hart
Ewe	6.18	5.15	4.17	0.93	16.43	Konig
Women	3.70	1.63	6.98	0.21	12.57	Gardner and Fox

Is it true that goat's milk has a disagreeable taste and odour?

It all depends upon conditions under which it is produced. Good flavoured goat's milk is entirely possible and is produced by hundreds of herds all over the world. The reason for complaint arises because milk is not drawn under sanitary conditions. The chief reasons for bad milk is due to particles of dirt or hair falling into the

milk, objectionable feeding, keeping animals in unclean quarters, and allowing the buck near the does whose smell contaminates the milk. If proper care is taken, as good tasting milk can be had from goats or from cows. The difference can hardly be detected. Complaints on this score are not the fault of the goat but that of the keeper.

What is the comparative estimated average milk consumption per person per day in India and other countries?

The following is given by the U. S. A. Department of Agriculture, Handbook of Dairy Statistics :—

Finland	...	36.8	oz. per day
Switzerland	...	30.9	do.
Canada	...	22.4	do.
United States	...	17.5	do.
Australia	...	16.3	do.
France	...	12.9	do.
Great Britain	...	11.0	do.
Germany	...	10.5	do.
India as a whole	...	3.52	do.

How does Madras compare with other Provinces of India in average daily milk consumption?

Sir John Megaw supplies the following information :—

Punjab	...	9.92	oz. per day.
United Provinces	...	4.96	do.
Bombay	...	4.00	do.
Bihar and Orissa	...	3.20	do.
Assam	...	2.24	do.
Bengal	...	1.92	do.
Madras	...	1.60	do.

These figures will show how little milk is used in

South India. The family goat could do a great deal to improve this situation and raise the standard of health.

Why is infant mortality in India so high compared with many other countries ?

It is estimated that about 1,250,000 Indian children die every year before reaching their first birthday. A large percentage of these deaths occur in rural areas. In thousands of Indian villages, absolutely no milk is available. Consequently, if a mother is not able to nurse her baby, or if she is not able to supply the minimum of about 20 ounces a day, the poor baby suffers from malnutrition.

An infant under 6 months of age cannot digest starch except in very small quantities. Solid food, as is often given in case of necessity, causes intestinal trouble. Lack of an adequate and suitable supply of milk therefore, is one of the great contributing causes for India's high infant mortality. Thousands of the poorer classes cannot afford to keep a good cow so that the lowly goat could perform a great service in this country if we would give her a chance. Would this not be better than seeing mothers attempt to nurse their children even up to 2 years of age ?

Is goat's milk more suitable than cow's milk for infants and invalids ?

There are numbers of authorities who have proved this to be the case to their own satisfaction. Note the testimony of Dr. Richard Schmidt, M. D. of Haimbal, Mo. U. S. A. given to the President of the American Goat Society :—

‘ Pursuant to my promise, I am enclosing herewith three photographs of Mr. Reymond Dryden's little son, who

had meningitis when eighteen months old. This baby had been given up, by the then attending physician, as a hopeless case. He was unconscious for eleven days, during which time he retained nothing but goat milk. Disease and starvation had so devitalised the little sufferer that all efforts seemed futile. But I took the case because goat milk had saved many a child's life for me in the past. In about a week's time the child regained consciousness.'

Showing a photograph taken a month later, he continues:

'This is what I call transformation—from a cadaverous skeleton to a plump, healthy child in one month speaks great praise for goat milk.'

Hundreds of other testimonials given by persons of unquestioned integrity, could be cited giving the beneficial results derived from the use of goat's milk. A prominent food expert in America says:—

'I quite agree with you in thinking pure, fresh goat's milk better nourishment for infants and children than cow's milk. The reason is that the goat is more like a grown human in size than any other milk animal. In addition to this, the goat is almost immune to tuberculosis. Unfortunately, the cow is not. I should like to see the use of goat's milk extended in this country.'

Bulletin 429 of the New York Agricultural Experiment Station reports on an extensive study on the use of goat's milk for infant feeding by two Buffalo, New York doctors and says:—

'Goat's milk was supplied in 18 cases for children who were not thriving on any other food that had been tried. In 17 cases, a satisfactory state of nutrition was

established through the use of goat's milk, the beneficial results in some instances being very marked. With certain of these children their situation was regarded as serious, and their restoration to a satisfactory nutritional condition was good evidence that goat's milk is often a very desirable resort for infant feeding.'

Have you yourself seen any hospitals or nursing homes giving preference to goat's milk?

Yes, near Buffalo, New York for example, we visited a very high class goat dairy, operated by a wealthy lady as a hobby. She had about 40 fine Saanan goats and all the milk was being used by high class hospitals and wealthy patients who were paying 75 cents a quart for the milk, while cow's milk there sold for 14 cents. We could give a number of such instances from personal observation in Europe and other countries as well.

Is tinned or condensed milk sold in India all cow's milk?

Not by any manner of means! Much of this, perhaps most of it, is made from goat's milk. I have visited several condensed and dried milk factories in Switzerland and Holland where this was being done. Many commercialised baby food manufacturers use goat milk as the base for their products. And then people say 'Oh, no, I would not use goat's milk!'

Is the use of Klim, Horlicks or tinned milk a good practice?

I say 'yes' without hesitation. But, I would qualify this by asking the question 'can the average person in India afford to do so?'

After all, what is the chief ingredient in all these prepared food products but milk? Why therefore not

keep a goat, a cow or a buffalo and produce your own milk rather than get it imported from other countries? Consider the fact that India has the largest cattle population of any country in the world as well as the most goats. And still India in 1935-36 imported 209,214,000 lbs. of condensed and preserved milk and



YOUNG SURTI DOE

10,395,000 lbs. of milk foods for infants and invalids. I ask you why? What can we do about it? My answer is that millions of people in India will never be able to afford the use of milk in their diet unless they produce it themselves. And the goat is certainly the most economical source for the family milk supply.

Is it not possible to get along with vegetable foods in India?

In case of necessity almost anything is possible. My counter question is—'Is it desirable or necessary?'

Protein is one of the most necessary food factors and so often lacking in India's starchy diet. Eggs, fish, meat and milk contain large quantities of protein. Competent authorities agree that protein derived from such animal sources is more valuable than that obtained from vegetable sources. Diets for growing children and pregnant or nursing mothers especially should contain some form of animal protein. Since vegetarians in India object to eggs and meat, milk would seem to be a satisfactory solution to the problem, since even vegetarians have no objection to the use of milk and milk products. India therefore should use this valuable food much more generally than is now the practice.

Is the adulteration of milk a serious consideration in India?

What housemother in India would doubt this fact? In the year 1935 the Government of India made an investigation to determine how commonly this practice obtained. Samples of milk were taken from as many and varied places as possible. In the Madras Presidency 1,798 samples were examined, out of which 1,182 were found adulterated to the extent of an average of 65.7 per cent water. One can see from this that we should really speak of water being adulterated with milk rather than calling it adulterated milk. It is a terrible condition. Not only do people pay good money for water but they may even be getting very impure and contaminated water, dangerous to the health of the family. This is another reason why families, if at all possible, should keep their own cow or goat to obviate this evil. Keep a pair of family milk-goats as a health insurance policy!

How can cottage cheese be made from goat's milk ?

Hold milk at a temperature of about 75 degrees F., until it develops a firm curd. If desired a small quantity of well-flavoured sour milk can be added to the sweet milk to hasten coagulation. When sufficiently firm, cut the curd into pieces about 2 inches square with a long knife or big spoon. Place the container of broken curd on the edge of the stove or in a vessel of water and heat slowly to 100 degree F. Hold at that temperature for about 45 minutes to firm the curd. During the heating and holding period, stir the curd gently with a spoon or ladle to secure uniform lumping. When sufficiently firm, pour the curd into a porous sack or a colander to drain. The flavour and keeping quality of the cheese will be improved if the curd is washed in cold water when the draining is practically complete. Add about one teaspoonful of salt to one pound of cheese and store in a cold place.

What is meant by 'tainted milk' ?

If a cow or goat is fed with very bitter feeds just before milking, the milk will taste badly. The meat of chickens fed heavily on cod liver oil up to the time of butchering is terrible. Therefore, cows or goats or chickens should be 'clean fed' if they are to produce palatable milk, eggs or meat. Neem (*Margosa*) leaves, for example, are very bitter and may taint the milk if fed within 2-3 hours of milking. All quality products can only be made from a good grade of materials. So, do not blame your goat, if you do not do your part. •

V. DISEASES AND TREATMENT

Is the goat a hardy or a delicate animal ?

Generally speaking, a goat is very hardy and not subject to the numerous diseases attacking most animals. However, the goat like other domesticated animals, is living under unnatural conditions and so requires good care and attention if it is to be healthy and happy.

‘ An ounce of prevention is worth a pound of cure.’ Does this apply to the care of goats ?

Most assuredly so ! It is much easier to keep your animals healthy and well than to try and doctor and dope them after they get sick. Clean feed, sanitary, well ventilated housing, prevention of attack from parasites, and regular care and attention will go a long way to overcome your goat troubles and repay you many times over in milk and healthy kids.

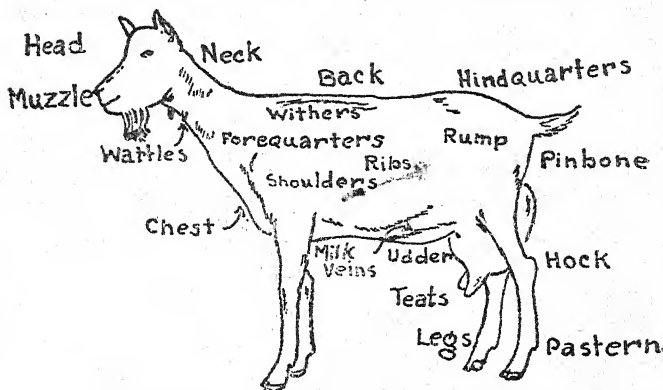
What should I do if my goat seems unwell ?

Isolate it from the other goats first of all as a precaution against the spread of infection. Then take its temperature with a clinical thermometer by rectum. Its normal temperature is from 101 to 103 degrees Fahrenheit. Give it only soft nourishing feeds and administer ‘ first aid ’. But, if it appears to be something serious, consult a good Veterinarian at once.

What are some of the most common ailments to look out for in dairy goats ?

Colds, Pneumonia or Bronchitis of the respiratory system ; indigestion, diarrhoea, constipation, bloat and

dysentery affecting the digestive system ; wounds, boils and inflammatory conditions ; inflammation of the udder,



POINTS OF CONFORMATION OF THE DAIRY GOAT

sore teats ; worms and parasites causing a run-down condition.

What can be done for a bad cold ?

Give the goat two tablespoons of Epsom salts with one teaspoon ginger. Feed a warm 'Kanji' or bran mash and no hard, dry feeds. If the goat develops a dry cough, it is good to give it inhalations of Eucalyptus and turpentine 2 or 3 times a day. Pour some Eucalyptus oil and turpentine and hot water over a little sawdust or bran in the bottom of a bucket and hold the goat's head in the steam. Cover the head of the goat so that it must inhale the fumes but be careful not to burn or choke the animal. A kettle of boiling water with the Eucalyptus and turpentine can also be used. This can be done to the best advantage in a well-closed room.

Are goats subject to Pneumonia?

Yes, it is one of the more common ailments of goats as well as one of the more dangerous diseases affecting them. Colds if neglected may develop into this trouble. Keep the animal warm and away from draughts. Cover her with a gunny sack or cloth. The old fashioned mustard plaster should be applied over the back and ribs after clipping the hair. Apply as warm as your hand can stand. The plaster can be tied on with old newspapers and sacking. Remove after half an hour or it will blister the skin. 'Kanji' should be fed at frequent intervals and a dose of Epsom salts given. Very careful attention is necessary.

My goat is constipated. What can I do for it?

Give an ounce of Epsom salts in a pint of warm water. Also give a warm bran mash an hour later.

What can be done for diarrhoea or dysentery?

Give a purgative of 4 oz. of castor oil. If the condition continues, give $\frac{1}{2}$ oz. of prepared chalk in a pint of warm water every alternate day. Five grains of sulphate of iron may also be given twice daily in water if dysentery persists. Give only dry grass or fodder; keep the animal warm; give water to drink that has been slightly warmed. The bulky feed should be reduced so as to give rest to the digestive organs and the animal should be kept apart and isolated.

What is the cause of small, swollen sores on the teats and udders of my goats and what can I do for them?

This is a condition occurring rather frequently soon after kidding. It should be attended to carefully from

the start before it spreads. It is a kind of pox and may become so bad as to cause fever and great discomfort. The sores may also spread to the mouth or lips of the sucking kids. The doe will object to being milked or sucked but the milk must be drawn or a caked udder and a dry goat will result. Hot fomentations should be applied to the udder at least twice a day before milking, then thoroughly dried and clean, sweet oil applied. A dose of Epsom salts should be given twice a week until the condition is cured. The goat should be isolated. The hands of the milker should be disinfected in phenyle before milking other goats or the condition is likely to spread. Give the doe your best attention.

What can I do for a caked udder ?

This condition is most apt to occur in the heaviest milkers, usually soon after the birth of kids. If *all* the milk is not drawn regularly, this condition is likely to develop and gradually become worse and the doe may be spoiled for life. Hot fomentations should be applied for 20 minutes, 4 or 5 times a day. Following this, the udder should be dried with a towel and then massaged gently with lard and sweet or camphorated oil. After this, the stringy, thick, milky secretion should be withdrawn. The doe should be milked every hour for a few days. This requires time and patience. Therefore, practise an ounce of prevention and see that this condition does not occur. It is usually due to carelessness on the part of the attendant. Be sure that *all* milk is drawn at *every milking*. If not, a caked udder is liable to result in the first few months when a goat is fresh and a dried up milk flow in the later part of the lactation period.

Are goats subject to infestation with worms?

Yes, particularly if kept on ground and premises where goats have been kept for a number of years. If goats lack in thriftiness, have long, rough looking hair, a swollen belly and are troubled with diarrhoea or constipation, the chances are that they are badly infested with worms. If the condition is not remedied, the animal will gradually waste away and death may result through weakness. Goats are troubled with both round worms and tape worms. Young, growing kids are most subject to this difficulty.

What treatment can be given for worms?

A satisfactory treatment for the removal of the common stomach worm is to use a one per cent solution of copper sulphate. Dissolve one ounce of freshly powdered copper sulphate in three quarts of warm water. The solution should be prepared in an earthen vessel as copper sulphate corrodes metal.

Tapeworms are also frequently present. Therefore take a half Madras measure of coarse tobacco stems and place in a half kerosene tin of water and boil very slowly for a few hours. Let this stand overnight, and in the morning pour off the water, straining it through a thin cloth. Add this tobacco solution to the copper sulphate mixture noted above in equal parts to make a stock solution.

The dosage to be given is:—

Animals 3 months old	...	$\frac{3}{4}$	fluid ounces
6 " "	...	$1\frac{1}{2}$	" "
12 " "	...	$2\frac{1}{2}$	" "
18 " "	...	3	" "
Adult animals	...	$3\frac{1}{2}$	" "

This should be given early in the morning before feeding, followed by a dose of Epsom salts, a tablespoonful per adult goat and half this amount for the younger stock. Feed and water may be given as usual after a hour or two. All the droppings should be carefully collected and burnt to destroy the worms. The routine use of this solution is a valuable control measure where goats are grazed or kept in quarters long used by goats so that the ground is more or less infested by worms.

How can liquid medicines be given to goats?

The cheapest method is to take a thin hollow bamboo about a foot long, closed at one end and tapered at the other. The dose of medicine is poured into this bamboo. The goat is then made to squat on its haunches and the liquid is poured into the back part of its mouth very slowly to avoid choking. Care must be taken that it does not get into the windpipe or serious consequences will result. A long-necked bottle can also be used.

How can I control lice on my goats?

In Western countries sheep and goats are dipped in prepared arsenical dips once or twice a year as a matter of routine. We have used commercial Sodium Flouride Powder rubbed into the hair of young kids quite satisfactorily. We have also diluted one ounce of this drug in a gallon of water. We then pour this into a bath tub and the young kids are immersed for about half a minute. Care must be taken that they do not drink this as it is poisonous. The head also should be kept above water and dipped for a second or two only.

Another good remedy is kerosene emulsion made by dissolving one-fourth pound of soap in two quarts of boiling water. Then gradually add one pint of kerosene oil, churning and mixing the whole solution violently. After this is thoroughly mixed into a soapy, uniform solution, add three quarts of water to the mixture after which the emulsion is ready for use. The kerosene emulsion is thoroughly applied and rubbed into the hair of the animal gently, after which the goats should be allowed to remain in a cool protected place till dry.

A second application should be made after five to eight days to kill the young lice that may have hatched from eggs laid before the first application.

What can I do for ticks on my goats?

Ticks, also called 'Blue bugs' are quite different from lice. Many people resort to hand-picking them from the ears and tender parts of the goat's body. When this is done, the parasites should be burnt.

Ticks are very resistant and it is with difficulty that they can be killed without harming the animal to which they are attached. In Western countries animals are dipped in huge tanks filled with arsenical dips. Where a few animals are kept, such a dip can be applied by hand washing with the following solution:—

Sodium carbonate (sal soda) half pound.

Arsenix Trioxide (white arsenic) . . . one-fifth pound.

Pine tar one-fiftieth gallon.

Water sufficient to make ten gallons.

To prepare the dip, bring a gallon of water to a boil. Add the sodium carbonate and dissolve by stirring. Then add the arsenic and dissolve in the same manner.

Heat the pine tar and pour it in a thin stream to the above, stirring it well at the same time. Then add the other nine gallons of water and wash the animals with the solution. The goats should not be exercised violently just before the treatment nor immediately afterward. They should also have a drink just before the application of the dip. If badly infested, the treatment should be repeated every fourteen days.

How can I tell the age of goats ?

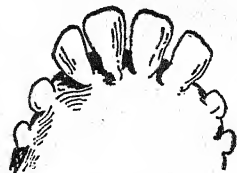
Goats have 'baby teeth' during the first year. In the second year one pair of larger permanent teeth appear,



KID
FIRST YEAR



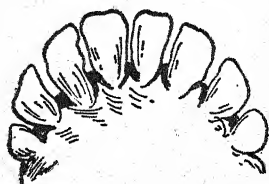
YEARLING
SECOND YEAR



TWO-YEAR-OLD
THIRD YEAR



THREE-YEAR-OLD
FOURTH YEAR



FOUR-YEAR-OLD
FIFTH YEAR

THE AGE OF GOATS UP TO ABOUT FIVE YEARS CAN BE ESTIMATED FROM THE NUMBER OF PERMANENT TEETH PRESENT.

two pairs in the third year and three pairs in the fourth year. Four- to five-year old goats have a complete set of 8 permanent teeth. After this, age can only be guessed at, judging by the appearance of the teeth and the general condition of the animal. (Note illustrations.)

Is it desirable to remove horns from dairy goats ?

Many goats inherit the hornless (polled) condition, which in accordance with Mendel's Law is dominant over the horned condition. The dairy goat has no particular need for horns and if present are often a nuisance in a large flock. Therefore, the removal of horns is frequently resorted to. The horns of mature goats can be removed by sawing them off close to the head with a common meat or hack saw. The wounds should be covered with tar to prevent bleeding and the breeding of flies. In small kids, horns can be prevented from developing by the application of caustic soda or potash. The end of a caustic stick, the size of a pencil, is moistened and rubbed on the horn button. A knife or clipper can also be used on small kids.

Should the hoofs of goats be trimmed ?

If the hoofs of goats are neglected they grow very long causing the gait to become unsteady. Untrimmed hoofs accumulate dirt that may emit bad odours rendering the premises unpleasant. For these reasons, as part of the routine to follow in the management of goats, hoofs should be trimmed whenever necessary. The cutting is made level with the body of the foot. To avoid injury of the sensitive part, thin portions are pared off carefully as the cut approaches the softer tissues. Small sharp pincers are convenient to use in cutting the horny edges. Later, in trimming the foot to a good form, a jack-knife is used. If a deep cut is made causing the foot to bleed, tincture of iodine should be applied and the animal kept in a pen until the wound has healed.

VI. HOUSING AND MANAGEMENT

What factors should be considered in designing a shed for goats?

Primary consideration should be given to providing adequate space, proper ventilation, good drainage and plenty of light.

What is the best type of shed for the family goat?

The cheapest form of building will be the 'lean-to' type, placed against the side of an existing building. Such a shed for a two goat family dairy should be 5 ft. wide by 10 ft. long. This length provides 1 foot for the manger, 4 ft. for the goats with 5 ft. to spare at the back for the kids. The 5 ft. width is sufficient for the two milking does with a one foot stub wall between them. The height nearest the wall should be 7 ft. 9 in. and the lower side 5 ft. 9 in. giving a slope of 2 ft. to the roof. This may be tiled or thatched. A good-sized open frame window on the lower side as well as an open framed door should be provided. Arrangements for storing hay or dried feed can be made overhead.

Is bedding required for a goat stall?

Goats prefer hard, dry, clean floors to lie on in preference to warm beds such as dogs, pigs or cattle seem to like. Straw or leaves may be used when necessary but the goats may scrape it away with their fore feet. The dry earth is preferable. In Malabar, where the rainfall is very heavy, goat sheds are made of wood and have slatted bottoms. The droppings and urine fall thru to the ground so that the shed is always clean and dry. Many goat dairies in the West follow this same

principle which is well suited to the maximum of comfort for the goat.

Is open grazing essential for a goat?

The goat is a restless animal and loves to roam about from one place to another in search of fresh food, nipping tender leaves and shoots and biting off tender buds and barking trees. It is this innate love of destruction that makes the goat the sworn enemy of the forester and gardener. But, it is a mistaken belief that this is necessary if goats are to thrive. I have visited a number of important goat breeding tracts in France, Switzerland, Italy and Holland where milking goats are always kept in stables without so much as a day's grazing the whole of their lives. Thousands of goats are kept confined in small back yards, in small towns and cities and still they are perfectly healthy and thrive as well as their ancestors did on open grazing. The jungle fowl, accustomed to the forest, upon domestication has accommodated itself to confined quarters. The goat is no less adaptable and has done it quite as satisfactorily. It therefore is not necessary for a goat to be a public nuisance by permitting it to roam at large.

When goats are stall-fed what routine should be followed?

Roughly speaking, the following schedule may be followed:—Early morning, when the goat is milked, it should be given about half of the concentrated food allotted for the day. After milking and watering, give all the leaves the goat will eat in 45 minutes. About eleven o'clock give some kitchen waste, or leaves and vegetables as available. At three in the afternoon give

kitchen kanji water mixed with soaked groundnut or gingelly cake followed by some leaves or fodder. Lastly, at night, again water before milking, give the other half of the grain feed and all the leaves the animal can dispose of.

What feeding rules should be observed ?

Firstly—Whatever food given should be presented in a perfectly clean condition and in containers that have been well cleaned.

Secondly—No more feed should be given at a time than what can be readily consumed. A goat can be very wasteful if given large quantities of feed at a time. Feed often rather than too much at a time.

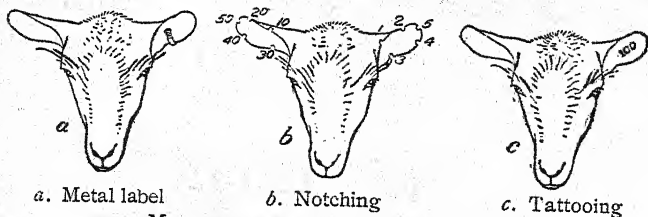
Thirdly—Be regular in your feeding schedule. Stick to regular hours and supply the ration each day without too great variation in quantities or time. This will keep up the appetite of the goat and repay you thru the milk pail.

Should goats be groomed?

Yes, as well as is true for horses and cattle. This is especially true if the animals are kept tied up or confined where they are not able to rub or scratch themselves. Rubbing and brushing should be done daily and an occasional washing is also good. Goats enjoy climbing and jumping. If a good post or a pile of rocks is provided they will amuse themselves and also do some of their own grooming. Remember that grooming animals serves the same purpose as bathing does for man. Treat it as of equal importance if you wish to have healthy animals.

How can I best mark or label my goats ?

This can be done by the use of metal numbered ear labels, or by notching or tattooing the ears as shown in the illustration. Some breeders use all three methods to be fully assured of identification. When this is done,



METHOD OF MARKING GOATS' EARS.

the ears are notched as soon after birth as possible and when the kids are from 3-6 months of age, the metal band is inserted and the ear tattooed with a special instrument, using indelible ink.

When should male kids be castrated ?

All buck kids not wanted for breeding should be castrated when from ten days to three weeks of age. This may be done by cutting off the lower third of the scrotum with a clean sharp knife, forcing the testicles down and pulling them away with the spermatic cord attached.

The Veterinary Department people will be glad to perform a bloodless operation with the use of the 'Burdizzo Castrator', which severs the spermatic cord under pressure.

Is it desirable for the same man always to do the milking ?

Very much so, goats, like cows become accustomed to a certain individual and may hold up their milk for a

stranger, causing trouble later. Regularity in all things, including the time of milking and the person doing it, is of prime importance. Do not let everybody fool with a valuable animal.

Are goats valued as children's pets?

Rich people in America often keep a few milking goats as a hobby and their children use the kids as pets. Few domesticated animals are more appreciated by children. They love to watch them climb and run and play. In places large males, particularly wethers, are broken to harness and make a very nice animal for children to drive in small carts and wagons.

What is the market price for milking goats?

That varies a great deal, of course, but a good milking doe should sell from Rs. 15 to Rs. 30. I have seen pure bred goats in America sell for Rs. 1,000 each in exceptional cases. Well-bred animals of known ancestry will be well worth the additional price demanded above that asked for the common bazaar goat.

Can you give some reliable, authentic milk records made by goats in India?

(a) The highest official record of milk production in India that I have seen recorded was 9 lbs. in 24 hours, and 1,300 lbs. in 8 months made by a Jumna Pari doe at the Mission Poultry Farm, Etah, United Provinces.

(b) A late report from the Government Cattle Farm, Hissar, shows that 71 goats of their selected Jumna Pari flock completed lactations with from 200 to 1,000 lbs. of milk per goat. The highest yielder in her fourth lactation, gave 992 lbs. of milk in 246 days with a maximum daily yield of six and a half lbs.

(c) In the Malabar area, a certain family has been in the goat business for 25 years. They keep a flock of 20 milk goats (including kids), of which 10 are in milk. They give an average of 18 lbs. of milk per day, which is watered down (not recommended by us) to 22 lbs. and fetches Rs. 2-12-0 by sale at 2 annas per lb. (one anna an ollock). Ten kids are sold every year at Rs. 5 each and two she-goats at Rs. 20 each. Expenditure consists of Re. 1 per day for 15 lbs. cake, 12 annas for jack leaves and 3 annas for a boy labourer. The net profit amounts to Rs. 20 per month. Their books seem to have been kept regularly so that the information can be considered fairly reliable and shows the possibility a goat dairy affords in India.

(d) In the month of March, 1942, we had a Missionary friend in Vellore take over a young doe without its kid. Our object was to keep actual accounts and see what could be done under ordinary city conditions. The doe was looked after by the bungalow gardener but the Missionary himself frequently milked the goat and gave it his personal attention. During the month she gave 251 ollocks of milk ($125\frac{1}{2}$ lbs.), which valued at 8 pies an ollock, the regular rate for which milk is sold by the Vellore Milk Union, amounted to Rs. 10-7-4. An anna worth of agithi leaves was purchased in the market each day. The cost of oil cake and gram, in accordance with our Katpadi basic ration, came to 9 pies a day making a total of 0-1-9 for leaves and concentrated feed a day, costing Rs. 3-6-3 during the month. Some leaves were cut on the compound and waste from the kitchen was also fed but not valued as this would not have been utilized otherwise. This left a net profit on the young

doe of Rs. 7-1-1 for the month. Our friend's family was immensely pleased with the excellent milk they had enjoyed and begged us to sell them the milking doe. One can easily see from these actual figures, that an animal like this is well worth Rs. 30, the rate at which we value her. She will pay for herself without any difficulty and a family can be assured of pure, fresh, clean, unadulterated milk.

(c) When we drove to Kodaikanal from Katpadi for our holiday this year, we packed along two of our milking goats as part of the family. The 12 hour, 320 mile trailer ride did not seem to phase them. We left their kids behind as 'Orphan Annie's' to be cared for by other does, although one kid was only 2 weeks old. We had 3 objectives in mind (1) I wanted to milk and care for these animals myself for a few weeks to get some authentic records—cost of feed, milk produced etc. (2) to exhibit them at our Annual Industrial Missionary Association Exhibition and (3) to have our own milk for the Summer. They were a grand success in all three respects. The children and I enjoyed milking, feeding, and caring for the goats as pets. Our family went off into the wilds for a camping trip and 'Alice' went along on tether like a dog. She is a third generation cross-bred Jumna-Pari doe having her first kid. She gave us 380 ollocks of milk (190 lbs.) in 31 days, Rs. 18 value at Kodaikanal prices. 'Mary,' who had been milking for 4 months, gave 308 ollocks, during the month, valued at Rs. 15-4-0. We bought a bag of feed—gram, cholam and oil-cake—costing Rs. 6 which provided all the concentrated food they needed. We bought Rs. 1-8-0 worth of leaves but they lived largely on table

scraps and offal contributed by our families and High Class School Boarding department. This left a net profit of Rs. 25-12-0 on the two goats for the month. We had all the fine milk and cream our family of 6 could use, even after providing a Madras measure a day to one of the neighbours for her baby. The servants also had a share for their coffee. Several visitors too were given a drink of goat's milk as a sample.

Some people may say, 'O, your servants are watering the milk to fool you.' 'No goat can produce so much' and similar remarks. I can now counter these by saying 'I milked and fed and cared for the animals myself.'

The two goats also attracted a great deal of attention in the exhibition, even side by side with fancy silks, laces and embroideries. We could have sold them at a fancy price, to a dozen different parties. The flower gardens on the place did not suffer nor was any complaint raised by the occupants of other near-by homes, thus proving also that goats need not be a nuisance.

Compare these specific instances I have named with the average yield of 445 lbs. given by cows in the Madras Province per year. I ask once again, why not have more and better goats to provide you and your family with a regular, cheap, clean and reliable milk supply? I think you will agree with me that goats which produce milk in such quantities as these are not 'vermin' nor a nuisance but real benefactors of humanity. Let us give such goats a deserving place in our thinking and use them in our family economy!

What good monthly dairy goat journal can you recommend?

1. *The Goat World*, Vincennes, Indiana, U.S.A.
2. *The Dairy Goat Journal*, Fairbury, Nebraska, U.S.A.
3. *The British Goat Society Journal*, Norfolk, England.

What other publications deal with dairy goats?

Literature devoted exclusively to goats is still very scarce. A good deal of material appears from time to time in various farm journals. Many colleges of agriculture have issued bulletins. However, much of the latest information is available in the monthly journals I have listed. Each of the Goat Breeders Societies print year books that give valuable information.

Some of the best books on goats are:—

- (a) *The Book of the Goat*, by Holmes Pegler, L. V. Gill, 170 Strand, London.
- (b) *Aids to Goatkeeping* (\$1.00) *Dairy Goat Journal*, Fairbury, Nebraska, U.S.A.
- (c) *Modern Milk Goats*, by Irmagarde Richards, Lippincott, Co., Philadelphia, Pa, U.S.A.

What are some organizations that promote the Milk Goat Industry?

- (a) The American Goat Society, New Place Station, Lincoln, Nebraska, U.S.A.
- (b) The British Goat Society, Roydon Road, Diss, Norfolk, England.
- (c) Milch Goat Breeders Association, Johannesburg, S. Africa.

